

Detailed Description of Preferred Embodiment

The present invention is directed to a system, principally in the form of a method, for stimulating hydrocarbon, i.e. oil and gas, production from a downhole well, where the system utilizes a high powered, ultrasonic transducer assembly to effect the stimulation through liquid gassification, cavitation, and breaking of cohesion bonds, of the affected strata surrounding the well. The invention can best be described with regard to the several Figures, where, like reference numerals represent like components or features throughout the various views.

Figure 1 illustrates in general, but simplified for purposes of understanding, the operation of the transducer assembly 10 of this invention, and its relationship to a downhole well 12, and hydrocarbon bearing strata 14 thereabout, where an exemplary well casing 15 has an I.D. of about 4 1/4" and includes plural perforations 16 in communication with the potential hydrocarbon producing strata 14. However, the operation of the system of this invention may be best understood by first considering the construction and operation of the transducer assembly 10.

The transducer assembly 10, illustrated in Figures 2 and 3, is a piezoelectric device that operates at a high frequency, on the order of 20kHz. Piezoelectricity is a phenomenon that has been known for years and can be found with products which occur in nature. Exerting pressure on certain naturally occurring crystals, such as quartz, or man made products, such as doped ceramics, can effect internal activity within the crystals or products. In many substances, the atoms are in the form of ions which are held together very tightly by their electric charges. Pressing the substances displaces the ions so that negative ions move toward one side of the substance, and positive ions toward the other. The

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